

 <p>Pollution Prevention Case Study</p>	<p style="text-align: center;">Larson Juhl, Inc.</p> <p style="text-align: center;">Reduction of Hazardous Paint Wastes through Machine Modification and Product Scheduling Strategies</p>
<p><i>Standard Industrial Classification (SIC)</i></p>	<p>Miscellaneous Wood Products (wood picture frame mouldings)/2499</p>
<p><i>Type of Waste</i></p>	<p>Flushing solvents from cleaning operations and flammable, liquid waste paint-related material</p>
<p><i>Strategy</i></p>	<p>Process Modification: paint and solvent supply systems were re-piped; finishing was scheduled to reduce color change contamination.</p>
<p><i>Company Background</i></p>	<p>Larson Juhl is one of the world's largest manufacturer and distributor of picture frame mouldings and related supplies with operations that span five continents. The Ashland, Wisconsin facility is the largest manufacturing operation with more than 160 employees. This facility specializes in manufacturing hardwood picture frame mouldings. Its product lines currently contain more than 100 profiles on pine, oak, ash, poplar, maple, cherry, and alder. Volume throughputs range between 350,000 - 500,000 linear feet per week.</p>
<p><i>Original Process</i></p>	<p>All mouldings start as rough sawn lumber of random length and width. A computer controlled "gang-rip" saw cuts the boards into rip-stock. The rip-stock is milled into mouldings, which are then sanded and finished. The finishing operations are the largest part of the manufacturing process and consist of: (3) automated staining spray machines; (2) sealing fan coaters and (4) automated top coating spray machines. There may be as many as eleven finishing steps through which more than 7-10 million feet of moulding are processed in a month's time.</p> <p>Cleaning Process: Paint was pumped, in parallel, through a complex manifold and piping system into the spray machine. Spray machines were cleaned after each application to remove paint and protect against color cross-contamination. The entire system was then flushed with virgin solvent until the spray guns ran clear. During the course of a day, the cleaning process consumed approximately 8-10 gallons of solvent and took from 15-25 minutes per machine.</p> <p>Color Changes: As materials were received from the milling operation they were immediately scheduled for paint and finish application. On a given day, the finishing department could run a dark color followed directly by a light color. This required extensive machine cleaning to prevent color contamination. Color changes averaged 30-45 changes per day for all machines.</p>
<p><i>Motivation</i></p>	<p>To improve employee and plant safety, minimize company liability, and reduce disposal and material costs. Disposal costs had increased 400% within a 16 month period and material costs had increased 200%-300% during the same period.</p>

<p><i>Pollution Prevention Process</i></p>	<p>Machine Design - Piping: Machines have been modified to remove paint distribution manifolds and excess piping. Pumps have been placed on carts and are piped directly into the spray guns in series; rather than running in parallel. Additional valving has been installed to allow cleaning to take place in a closed-loop system. System flushing is completed in two steps to minimize waste generation, product loss, and emissions. Step 1: drain back to remove as much paint as possible from the lines. This is done by draining the system, through valving, back into the paint container for reuse at a later date. Step 2: reuse flush solvent - two gallons of clean solvent is allocated to each machine at the beginning of the day for all color changes. After step 1, pick-up hoses are placed in this container and air and solvent are pushed through the system. The initial flushing material (paint, air, and a small amount of solvent) is returned to the paint container for reuse. After this initial "purge", the solvent is circulated and returned to the solvent container for reuse in the next color change.</p> <p>Color Change Scheduling: Colors are now run lighter to darker as the day progresses since darker colors will absorb lighter colors more readily. This allows for a less thorough cleaning of the system. Additional inserts have been installed on the spray machine to allow them to be changed separate from the rest of the machine and thus prevent cross contamination of materials.</p>
<p><i>Material/Energy Balance</i></p>	<p><i>Original Process</i></p> <p>Feedstock Flushing solvents containing toluene and xylene</p> <p>Waste Volatile organic compounds (VOCs), waste solvent</p> <p>Disposal Air emissions and hazardous waste. The waste solvent was removed and distilled by a hazardous waste management company, then returned to Larson Juhl for reuse. Some of this material was returned contaminated with trichloroethylene because the management company was batch processing the waste material with waste from other companies.</p> <p><i>Pollution Prevention Process</i></p> <p>Feedstock Same</p> <p>Waste 75% - 80% reduction of flushing solvents and thus a reduction in waste solvent and VOC air emissions.</p> <p>Disposal Reduction of 68,000 pounds of waste solvent. Hazardous waste is now</p>

	removed by a different waste management company that fuel-blends and then burns the waste in cement kilns.
<i>Economics</i>	<p>Capital Costs No significant capital costs were required for this project.</p> <p>Operation/Maintenance Costs None</p> <p>Payback Period Immediate. \$30,000+ savings in disposal costs/per year <u>\$20,000+ material savings</u> (solvent)/per year \$50,000 + savings/per year</p>
<i>Benefits</i>	The process modifications have resulted in: an overall reduction in solvent use; increased efficiency by making color change-overs quicker (reduced by 10-15 minutes); increased material capture for reuse; better work environment and increased employee morale; and a more environmentally friendly operation.
<i>Other Pollution Prevention Activities</i>	Larson Juhl is currently using a water-based top-coat in one of its product lines and is investigating the possibility of using it in all top-coating operations. Coating operations currently comprise 50% of all coating operations in the finishing department. In addition, Larson Juhl has been researching 100% foil coverings, UV coatings, and water based stains.
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<i>Pollution Prevention Resources</i>	<p>Free, On-site Technical Assistance University of Wisconsin Extension Solid and Hazardous Waste Education Center Milwaukee area: 414/475-2845 Remainder of state: 608/262-0385</p> <p>Pollution Prevention Information Clearinghouse Wisconsin Department of Natural Resources Cooperative Environmental Assistance 608/267-9700 or e-mail: cea@dnr.state.wi.us</p>



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